

**ABSTRACT**

A method is provided for obtaining high-resolution performance from a standard image sensor, such as a single-chip image sensor. Since single-chip color image sensing is often the least expensive way to obtain color images, the invention helps to lower the cost of high-resolution machine vision performance. The color image produced by the single-chip image sensor is processed in two ways at run-time. In one stage of run-time, processing is performed on the original color image provided by the image sensor, including normal low-resolution image processing and low-resolution machine vision analysis. In another stage of run-time, a high-resolution search model is determined to search the color image using knowledge of the geometric properties of the arrangement of the pixels of the low-resolution image sensor, and the sub-pixel phase of the high-resolution search model. The invention can as much as double the accuracy of machine vision analysis using a standard color camera.